WHAT IS CLAIMED IS:

1. A directional measuring device that measures a direction of a body of the directional measuring device in a three-dimensional space including an X-axis indicating magnetic north on a horizontal plane, a Y-axis orthogonal to the X-axis in the horizontal plane, and a Z-axis orthogonal to the horizontal plane, assuming that the body points towards an x-axis, comprising:

a tilt angle detector that detects an x-axis tilt angle that is an angle between the x-axis and the horizontal plane and a y-axis tilt angle that is an angle between a y-axis, which is orthogonal to the x-axis, and the horizontal plane;

a converter that rotates, based on the x-axis tilt angle and the y-axis tilt angle, the x-axis and the y-axis to obtain a rotated-x-axis and a rotated-y-axis that are in the horizontal plane;

a primary azimuth calculator that calculates a primary azimuth that is an angle between the X-axis and the rotated-x-axis; and

an azimuth error angle extracting unit that extracts, based on the x-axis tilt angle, the y-axis tilt angle, and the primary azimuth, an azimuth error angle included in the primary azimuth due to rotation by the converter.

2. The directional measuring device according to claim 1, wherein the azimuth error angle includes a first error angle by a predetermined amount based on a direction and a magnitude of each of the x-axis tilt angle and the y-axis tilt angle.

3. The directional measuring device according to claim 2, wherein the azimuth error angle includes a second error angle that represents a variation by which the first error angle varies according to a value of the primary azimuth.

4. The directional measuring device according to claim 1, further comprising:

a secondary azimuth calculator that calculates, based on the primary azimuth and the azimuth error angle, a secondary azimuth that represents a direction of the body.

5. The directional measuring device according to claim 4, further comprising:

a declination input unit that receives a declination at a present position of the body, wherein

the second azimuth calculator calculates the second azimuth from the declination.

6. The directional measuring device according to claim 1, further comprising:

a first-axis geomagnetic force detector that detects a geomagnetic force along a first axis from among the x-axis, the y-axis, and the z-axis, which is orthogonal to both the x-axis and the y-axis;

a second-axis geomagnetic force detector that detects a

geomagnetic force along a second axis other than the first axis from among the x-axis, the y-axis, and the z-axis;

a total geomagnetic force input unit that receives a total geomagnetic force at a present position of the body, wherein the total geomagnetic force is a vector addition of geomagnetic forces along the X-axis, the Y-axis, and the Z-axis; and

a geomagnetic force calculator that calculates a geomagnetic force along a third axis other than the first axis and the second axis, from among the x-axis, the y-axis, and the z-axis based on the total geomagnetic force and the geomagnetic forces along the first axis and the second axis, wherein

the primary azimuth calculator calculates the primary azimuth based on the geomagnetic forces along the first axis to the third axis.

7. A directional measuring method of measuring a direction of a body of the directional measuring device in a three-dimensional space including an X-axis indicating magnetic north on a horizontal plane, a Y-axis orthogonal to the X-axis in the horizontal plane, and a Z-axis orthogonal to the horizontal plane, assuming that the body points towards an x-axis, comprising:

detecting an x-axis tilt angle that is an angle between the x-axis and the horizontal plane and a y-axis tilt angle that is an angle between a y-axis, which is orthogonal to the x-axis, and the horizontal plane;

rotating, based on the x-axis tilt angle and the y-axis tilt angle, the x-axis and the y-axis to obtain a rotated-x-axis and a rotated-y-axis

that are in the horizontal plane;

calculating a primary azimuth that is an angle between the X-axis and the rotated-x-axis; and

extracting, based on the x-axis tilt angle, the y-axis tilt angle, and the primary azimuth, an azimuth error angle included in the primary azimuth due to rotation by the converter.

8. The directional measuring method according to claim 7, wherein the azimuth error angle includes a first error angle by a predetermined amount based on a direction and a magnitude of each of the x-axis tilt angle and the y-axis tilt angle.

9. The directional measuring method according to claim 8, wherein the azimuth error angle includes a second error angle that represents a variation by which the first error angle varies according to a value of the primary azimuth.

10. The directional measuring method according to claim 7, further comprising:

calculating, based on the primary azimuth and the azimuth error angle, a secondary azimuth that represents a direction of the body.

11. The directional measuring method according to claim 10, further comprising receiving a declination at a present position of the body, wherein

the calculating the secondary azimuth includes calculating the second azimuth from on the declination.

12. The directional measuring method according to claim 7, further comprising:

detecting a geomagnetic force along a first axis from among the x-axis, the y-axis, and the z-axis, which is orthogonal to both the x-axis and the y-axis;

detecting a geomagnetic force along a second axis other than the first axis from among the x-axis, the y-axis, and the z-axis;

receiving a total geomagnetic force at a present position of the body, wherein the total geomagnetic force is a vector addition of geomagnetic forces along the X-axis, the Y-axis, and the Z-axis; and

calculating a geomagnetic force along a third axis other than the first axis and the second axis, from among the x-axis, the y-axis, and the z-axis based on the total geomagnetic force and the geomagnetic forces along the first axis and the second axis, wherein

the calculating the primary azimuth includes calculating the primary azimuth based on the geomagnetic forces along the first axis to the third axis.

13. A computer program that realizes on a computer a directional measuring method of measuring a direction of a body of the directional measuring device in a three-dimensional space including an X-axis indicating magnetic north on a horizontal plane, a Y-axis orthogonal to

the X-axis in the horizontal plane, and a Z-axis orthogonal to the horizontal plane, assuming that the body points towards an x-axis, the computer program making the computer execute:

detecting an x-axis tilt angle that is an angle between the x-axis and the horizontal plane and a y-axis tilt angle that is an angle between a y-axis, which is orthogonal to the x-axis, and the horizontal plane;

rotating, based on the x-axis tilt angle and the y-axis tilt angle, the x-axis and the y-axis to obtain a rotated-x-axis and a rotated-y-axis that are in the horizontal plane;

calculating a primary azimuth that is an angle between the X-axis and the rotated-x-axis; and

extracting, based on the x-axis tilt angle, the y-axis tilt angle, and the primary azimuth, an azimuth error angle included in the primary azimuth due to rotation by the converter.